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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/701,585	01/02/2001	Tetsuya Fukunaga	199589USOPCT	6219

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1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

LISH, PETER J

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 03/07/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/701,585

Applicant(s)

FUKUNAGA, TETSUYA

Examiner

Peter J Lish

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-8, 10-24, 26-27, and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-8, 10-24, 26-27, and 29-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

Claims 2, 6, 12, 17, 18, 22 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2, 6, 12, 18, and 22 are unclear as to how a material such as zirconium or magnesium is reduced to ZrO_2 or MgO , given that these are the fully oxidized forms of the metals. It is also noted that the independent process claim, claim 10, does not have a reducing step.

Claims 17, 18, and 31 are unclear as no steps are recited concerning the reforming. Thus, the preamble does not match the body of the claim. Claim 31 is particularly unclear as to what reactants are used. A format such as recited in claim 30 is suggested.

Claim Rejections - 35 USC § 102

Claims 2-8 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hironobu et al. (JP 09-029097).

Art Unit: 1754

Hironobu et al. disclose a hydrocarbon steam reforming catalyst which consists of an alpha-aluminum support, a zirconium component of between 0.05-5 wt%, a magnesium component of between 0.05-20 wt%, a ruthenium component of about 0.5 wt%, and a cobalt component of about 1.0 wt%. Additionally, the cobalt content is from 0.01 to 30 based on atomic ratio of cobalt to ruthenium. No differences are seen in the form of the zirconium.

The catalyst of Hironobu et al. may be produced by contacting solutions containing zirconium, magnesium, cobalt, and ruthenium.

The steam reforming process of Hironobu et al. involves contacting the catalyst with a hydrocarbon and a reforming gas, such as steam. As the hydrocarbon, methane, LPG, naptha, etc. may be used.

Claim Rejections - 35 USC § 103

Claims 10, 15, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironobu et al. (JP 09-029097).

Hironobu et al. is applied above. Hironobu et al. do not explicitly teach the production of the catalyst by contacting with a solution containing zirconium, followed by contacting with a solution containing ruthenium, cobalt, and magnesium. However, Hironobu et al. teach that there is no limit about the sequence and the method of addition of each component, and further that simultaneous additions may be carried out. It would have been obvious to one of ordinary skill at the time of invention to perform the addition of zirconium followed by the simultaneous addition of ruthenium, magnesium, and cobalt.

Art Unit: 1754

Hironobu et al. also do not explicitly teach the steam reforming of such hydrocarbons as methanol, ethanol, diethyl ether, or natural gas. However, Hironobu et al. teach that there is especially no limit as to the hydrocarbon which may be used in the process. It would have been obvious to one of ordinary skill at the time of invention to use methanol, ethanol, diethyl ether, or natural gas as the hydrocarbon, as it is well known in the art to do so.

Claims 16-24, 26-27, 29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironobu et al. as applied to claims 2-8 and 10-15 above, and further in view of Olsen et al. (EP 0734086 A1).

Hironobu et al. do not explicitly teach the use of a steam and carbon dioxide gas mixture for use as the reforming gas. Olsen et al. teach the use of ruthenium-containing catalysts for hydrocarbon reforming by use of carbon dioxide or carbon dioxide and steam mixtures. It would have been obvious to one of ordinary skill at the time of invention to use carbon dioxide in the reforming gas, as taught by Olsen et al., because it is reacted with the hydrocarbon to produce the same products.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 703-308-1772. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 703-308-3837. The fax phone numbers for the

Application/Control Number: 09/701,585

Page 5

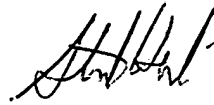
Art Unit: 1754

organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-305-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

PL

March 3, 2003



STUART L. HENDRICKSON
PRIMARY EXAMINER